

What is claimed is:

1. An optical fiber coupler for connecting a first fiber optic element to a second fiber optic element, the coupler comprising:

a first fiber optic element extending in a first direction whereby to position a free end of said first fiber optic element in a selected zone;

a second fiber optic element extending into the selected zone from a direction generally opposite to the first direction to position a free end of said second fiber optic element in the selected zone and proximate the first fiber optic element free end; and

a cured optical grade epoxy resin body comprising the selected zone and enveloping the free ends of said fiber optic elements;

whereby to provide physical and optical connection between said first and second fiber optic elements.

2. The coupler in accordance with claim 1 wherein said first fiber optic element comprises a single fiber optic strand and

said second fiber optic element comprises a plurality of fiber optic strands.

3. The coupler in accordance with claim 1 wherein said body is provided with a cone-shaped end and a generally planar base end.

4. The coupler in accordance with claim 3 wherein said first fiber optic element comprises a single fiber optic strand disposed in an apex of the cone-shaped end of said body and the single fiber optic strand extends through the apex and into said body.

5. The coupler in accordance with claim 4 wherein said second fiber optic element comprises a plurality of fiber optic strands extending into said body through the base end.

6. The coupler in accordance with claim 1 wherein said first and second fiber optic elements comprise at least one fiber optic strand and at lease another fiber optic strand, respectively.

7. The coupler in accordance with claim 6 wherein the free end of each of said at least one fiber optic strand of said first fiber optic element and the free end of each of said at least another fiber optic strand of said second fiber optic element are butt-end terminated.

8. The coupler in accordance with claim 1 wherein at least one of said first and second fiber optic elements comprises a plurality of fiber optic strands, the positions to which the free ends of said first and second elements extend being spaced apart by a distance allowing a sufficient extent of diffusion of light in the optical grade epoxy resin therebetween to couple light between each strand of one of said first and second fiber optic elements with each strand of the other of said elements.

9. The coupler in accordance with claim 5 wherein said plurality of fiber optic strands is arranged in a ring-like pattern about a central axis of the cone-shaped end of said body.

10. A method for connecting a first fiber optic element to a second fiber optic element, the method comprising the steps of:

providing a rigid elongated body having a cone-shaped end and an opposite circular and planar base end;

coating outer surfaces of the body other than the base end with a layer of mold making wax;

separating the body from the wax to provide a hollow wax housing having a cone-shaped end and an open base end;

providing a hole in an apex of the housing cone-shaped end;

inserting a first fiber optic element comprising a single fiber optic strand through the hole in a first direction into the wax housing to position a free end of the single fiber optic strand in the housing;

applying a sealant to the single strand at the housing apex hole;

inserting the second fiber optic element comprising a plurality of fiber optic strands into the wax housing through the open-base end from a direction generally opposite to the first direction to position free ends of the plurality of fiber optic strands in the housing and proximate the single fiber optic strand free end, the positions to which the free ends of said first and second element strands are inserted being spaced apart by a distance to allow a sufficient extent of diffusion of light in the optical grade epoxy resin therebetween to couple light between the strand of the first fiber optic element and each strand of the second of the fiber optic elements;

filling the wax housing with optical grade epoxy resin and
permitting the resin to cure;

whereby to effect physical and optical connection between
the first and second fiber optic elements; and

removing the wax housing from the resin.